Release notes for ENDF/B Development n-003_Li_007 evaluation

April 26, 2017

- `fudge-4.0` Warnings:

  1. Cross section does not match sum of linked reaction cross sections
     crossSectionSum label 0: total (Error # 0): CS Sum.

     ```
     WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 1.69%
     ```

  2. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
     Section 0 (total): / Form 'eval': / Component 1 (Error # 0): Condition num.

     ```
     WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small
     ```

  3. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
     Section 4 (n + Li7): / Form 'eval': / Component 1 (Error # 0): Condition num.

     ```
     WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small
     ```

  4. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
     Section 5 ((z,n)): / Form 'eval': (Error # 0): Condition num.

     ```
     WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small
     ```

  5. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
     Section 7 (n[multiplicity:'3'] + He4 + H1): / Form 'eval': (Error # 0): Condition num.

     ```
     WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small
     ```

  6. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
     Section 8 (Li8 + gamma): / Form 'eval': / Component 0 (Error # 0): Condition num.

     ```
     WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small
     ```

  7. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
     Section 8 (Li8 + gamma): / Form 'eval': / Component 1 (Error # 0): Condition num.

     ```
     WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small
     ```

  8. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
     Section 9 (H2 + He6_s): / Form 'eval': (Error # 0): Condition num.

     ```
     WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small
     ```

  9. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
     Section 10 (lump0): / Form 'eval': (Error # 0): Condition num.

     ```
     WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small
     ```

10. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 11 (lump1): / Form 'eval': (Error # 0): Condition num.

```
WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small
```

11. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 12 (lump2): / Form 'eval': (Error # 0): Condition num.

```
WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small
```

12. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 18 (lump3): / Form 'eval': (Error # 0): Condition num.

```
WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small
```

13. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 24 (lump4): / Form 'eval': (Error # 0): Condition num.

```
WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small
```

14. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 29 (lump5): / Form 'eval': (Error # 0): Condition num.

```
WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small
```

15. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 33 (lump6): / Form 'eval': (Error # 0): Condition num.

```
WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small
```

16. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 36 (lump7): / Form 'eval': (Error # 0): Condition num.

```
WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small
```

17. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 38 (lump8): / Form 'eval': (Error # 0): Condition num.

```
WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small
```

- `fudge-4.0` Errors:

1. Energy range of data set does not match cross section range
reaction label 6: n + (Li7_e6 ->H3 + He4) / Product: n / Distribution: / angularTwoBody - XYs2d: (Error # 0): Domain mismatch (a)

```
WARNING: Domain doesn't match the cross section domain: (5295600.0 -> 20000000.0) vs (5295640.0 -> 20000000.0)
```

2. Energy range of data set does not match cross section range
reaction label 33: n[multiplicity:'2'] + Li6 / Product: n / Distribution: / uncorrelated - angular - XYs2d: (Error # 0): Domain mismatch (a)

```
WARNING: Domain doesn't match the cross section domain: (8292900.0 -> 20000000.0) vs (8292880.0 -> 20000000.0)
```

3. Energy range of data set does not match cross section range
reaction label 33: n[multiplicity:'2'] + Li6 / Product: n / uncorrelated - energy - XYs2d: (Error # 0): Domain mismatch (a)

```
WARNING: Domain doesn't match the cross section domain: (8292900.0 -> 20000000.0) vs (8292880.0 -> 20000000.0)
```

4. Energy range of data set does not match cross section range
reaction label 35: n[multiplicity:'2'] + He4 + H2 / Product: n / Distribution: / uncorrelated - angular - XYs2d: (Error # 0): Domain mismatch (a)

```
WARNING: Domain doesn't match the cross section domain: (9978200.0 -> 20000000.0) vs (9978230.0 -> 20000000.0)
```

5. Energy range of data set does not match cross section range
reaction label 35: n[multiplicity:'2'] + He4 + H2 / Product: n / uncorrelated - energy - XYs2d: (Error # 0): Domain mismatch (a)

```
WARNING: Domain doesn't match the cross section domain: (9978200.0 -> 20000000.0) vs (9978230.0 -> 20000000.0)
```

6. A summed covariance refers to another which refers back to the first which refers the second which refers to the first which refers to the ...
(Error # 4): Cyclic

```
n-003_Li_007.endf: WARNING: Cyclic dependency in summed covariances for sections /covarianceSuite/section[@label
```

- `njoy2012` Warnings:

1. This nuclide has no URR and NJOY is upset about it
unresr...calculation of unresolved resonance cross sections (0): No URR

```
 ---message from unresr---mat  328 has no resonance parameters
                           copy as is to nout
```

2. This nuclide has no URR and NJOY is upset about it
purr...probabalistic unresolved calculation (0): No URR

```
 ---message from purr---mat  328 has no resonance parameters
                           copy as is to nout
```

3. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
groupr...compute self-shielded group-averaged cross-sections (0): GROUPR/conver (0)

```
 ---message from conver---cannot do complete particle production for mt= 16
                           only mf4/mf5 provided
```

4. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
groupr...compute self-shielded group-averaged cross-sections (1): GROUPR/conver (0)

```
 ---message from conver---cannot do complete particle production for mt= 24
                          only mf4/mf5 provided
```

5. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
groupr...compute self-shielded group-averaged cross-sections (2): GROUPR/conver (0)

```
 ---message from conver---cannot do complete particle production for mt= 25
                          only mf4/mf5 provided
```

6. Coefficient mismatch of some sort
covr...process covariance data (1): COVR/matshd (2)

```
 ---message from matshd---processing of mat/mt  328/  2 vs. mat1/mt1  328/  2
                          largest coefficient=  1.26349E+01 at index 607 616
```

7. The number of coefficients was too large in a covariance
covr...process covariance data (2): Cov:Too many coeff.

```
 ---message from matshd--- 800 coefficients > 1
                          reset and continue.
```

8. The number of coefficients was too large in a covariance
covr...process covariance data (3): Cov:Too many coeff.

```
 ---message from matshd--- 632 coefficients > 2
                          reset and continue
```

9. Coefficient mismatch of some sort
covr...process covariance data (4): COVR/matshd (2)

```
 ---message from matshd---processing of mat/mt  328/  2 vs. mat1/mt1  328/  4
                          largest coefficient= -2.84520E+01 at index 607 563
```

10. The number of coefficients was too large in a covariance
covr...process covariance data (5): Cov:Too many coeff.

```
 ---message from matshd--- 467 coefficients > 1
                          reset and continue.
```

11. The number of coefficients was too large in a covariance
covr...process covariance data (6): Cov:Too many coeff.

```
 ---message from matshd--- 456 coefficients > 2
                          reset and continue
```

12. Coefficient mismatch of some sort
covr...process covariance data (7): COVR/matshd (2)

```
---message from matshd---processing of mat/mt  328/  2 vs. mat1/mt1  328/851
                         largest coefficient=  8.81577E+00 at index 607 603
```

13. The number of coefficients was too large in a covariance
covr...process covariance data (8): Cov:Too many coeff.

```
---message from matshd--- 171 coefficients > 1
                         reset and continue.
```

14. The number of coefficients was too large in a covariance
covr...process covariance data (9): Cov:Too many coeff.

```
---message from matshd--- 152 coefficients > 2
                         reset and continue
```

15. Coefficient mismatch of some sort
covr...process covariance data (10): COVR/matshd (2)

```
---message from matshd---processing of mat/mt  328/  4 vs. mat1/mt1  328/851
                         largest coefficient=  1.50163E+00 at index 563 603
```

16. The number of coefficients was too large in a covariance
covr...process covariance data (11): Cov:Too many coeff.

```
---message from matshd--- 256 coefficients > 1
                         reset and continue.
```

- `xsectplotter` Errors:

1. Exception IndexError was thrown
/usr/local/lib/python2.7/site-packages/matplotlib-1.5.3-py2.7-linux-x86_64.egg/matplotlib/font_manager.py:2
UserWarning: Matplotlib is building the font cache using fc-list. This may take a moment. (Error # 2): IndexError

```
IndexError: index out of range
```